

**AMENDED CLAIMS**

1-15 Canceled

- 1 16. (currently amended) A downhole injection evaluation system comprising:
- 2 (a) at least one downhole fiber optic sensor permanently disposed a first well
- 3 for sensing at least one parameter associated with injecting a fluid into a
- 4 formation;
- 5 (b) at least one additional downhole fiber optic sensor in a second well,
- 6 the at least one additional sensor operably connected to the at least one
- 7 fiber optic sensor in the first well;
- 8 wherein said first well is ~~selected from~~ one of (I) an injection well, and (II) a
- 9 production well and the second well is the other of (I) an injection well, and (II) a
- 10 production well.
- 11

- 1 17. (currently amended) A downhole injection evaluation system as claimed in claim
- 2 16 wherein said system further includes an electronic controller operably
- 3 connected to said at least one of the downhole fiber optic sensor-sensors.
- 4

1 18. canceled

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- 3 19. (previously presented) A system for controlling hydrocarbon production
- 4 comprising:

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- 5 a) a production well;
- 6 b) an injection well having a data link to said production well ;
- 7 c) at least one sensor located in either of said injection well and said
- 8 production well, said at least one sensor being capable of sensing at least
- 9 one parameter associated with an injection operation, said sensor being
- 10 operably connected to a controller for controlling injection in the injection
- 11 well.

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13 20. **canceled.**

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- 1 21. (currently amended) A downhole injection evaluation system as claimed in
- 2 ~~claim 17~~ claim 16 wherein said system further includes at least one downhole
- 3 acoustic signal generator whereby signals generated by said at least one signal
- 4 generator reflect off a flood fluid/hydrocarbon interface and are received by said
- 5 at least one of the downhole sensor ~~sensors~~.

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1 22-59. **canceled**

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1 60. Canceled

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- 1 61. (currently amended ) The system of claim 17 wherein said electronic controller is at
- 2 one of (i) a surface location, and (ii) a downhole location.

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1 62. canceled

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1 63. canceled

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1 64. (currently amended ) The system of ~~claim 18~~ claim 16 wherein said sensor in said  
2 first well is operably connected to said sensor in said second well by a fiber optic  
3 link.

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1 65. (currently amended) The system of ~~claim 63~~ claim 16 further comprising a  
2 controller for controlling which controls a flow control device in at least one of  
3 the first well and the second well.

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1 66. (previously presented) The system of claim 65 wherein said flow control device is  
2 selected from the group consisting of: (i) a valve, (ii) fluid control device, (iii)  
3 packer, (iv) sliding sleeve, (v) safety valve, (vi) an anchor, and (vii) a pump.

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1 67. (currently amended) The system of ~~claim 63~~ claim 21 further comprising an  
2 acoustic receiver in at least one of the first well and the second well.

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1 68. canceled

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- 1 69. (currently amended) The system of claim 67 wherein said acoustic receiver  
2 receives acoustic signals indicative of at least one of (i) a location of fluid front  
3 between the first well and the second well, and (ii) a fracture between the first  
4 well and the second well.
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- 1 70. **canceled**
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- 1 71. (currently amended) The system of ~~claim 70~~ claim 69 wherein said signals are  
2 produced by a change in said a fracture in the earth formation.
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- 1 72. **canceled**
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- 1 73. **canceled**
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- 1 74. (currently amended) A method of producing hydrocarbons from a subterranean  
2 reservoir comprising:  
3 a) permanently installing at least one downhole fiber optic sensor in a first  
4 well;  
5 (b) operably connecting at least one fiber optic sensor in a second well to the  
6 at least one fiber optic sensor in the first well;  
7 wherein the first well is one of (I) an injection well, and (II) a production well and  
8 the second well is the other of (I) an injection well, and (II) a production well. .

9                   ~~for sensing at least one parameter associated with injection of a fluid into~~  
10                   ~~said reservoir.~~

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1    75.   (currently amended ) The method of claim 74 further comprising using an  
2           electronic controller operably connected to ~~said~~ at least one of the downhole fiber  
3           optic ~~senser~~ sensors.

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1    76.   canceled

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1    77.   (currently amended) The method of claim 74 further comprising  
2           (i)    using at least one downhole acoustic signal generator for generating  
3           signals that interact with a flood front in said reservoir, and  
4           (ii)   receiving signals resulting from said interaction with ~~said~~ at least one  
5           of the downhole ~~senser~~ sensors.

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1    78.   Canceled

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1    79.   (currently amended) The method of claim 75 further comprising positioning  
2           said electronic controller at one of (i) a surface location, and (ii) a downhole  
3           location.

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1    80.   canceled

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1 81. **canceled**

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1 82. (currently amended) The method of claim 76 further comprising operably  
2 connecting said at least one sensor in said first well to said at least one sensor in  
3 said second well by a fiber optic link.

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1 83. (currently amended) The method of ~~claim 81~~ claim 74 further comprising using a  
2 controller for controlling a flow control device in at least one of the first well and  
3 the second well.

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1 84. (previously presented) The method of claim 83 wherein said flow control device  
2 is selected from the group consisting of: (i) a valve, (ii) fluid control device, (iii)  
3 packer, (iv) sliding sleeve, (v) safety valve, (vi) an anchor, and (vii) a pump.

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1 85. (currently amended) The method of ~~claim 81~~ claim 74 further comprising using  
2 an acoustic receiver in at least one of the first well and the second well for  
3 receiving acoustic signals.

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1 86. (currently amended) The method of ~~claim 81~~ claim 74 further comprising using  
2 an acoustic transmitter in at least one of the first well and the second well for  
3 sending acoustic signals into said reservoir.

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1 87. (currently amended) The method of claim 85 further comprising using said  
2 acoustic receiver for receiving acoustic signals indicative of at least one of (i) a  
3 location of a fluid front between the first well and the second well, and (ii) a  
4 fracture between the first well and the second well.

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1 88. **canceled**

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1 89. (currently amended) The method of ~~claim 88~~ claim 87 wherein said signals are  
2 produced by a change in said fracture.

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1 90. (previously presented) The method of claim 86 further comprising using said  
2 acoustic receiver for receiving acoustic signals indicative of a location of fluid  
3 front between the first well and the second well.

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1 91. (previously presented) The method of claim 86 further comprising using said  
2 acoustic receiver for receiving acoustic signals indicative of a location of a  
3 fracture between the first well and the second well.

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1 92. (currently amended) The method of ~~claim 81~~ claim 74 further comprising:  
2 (i) using an acoustic transmitter in one of said two wells for propagating  
3 acoustic signals into said reservoir, and

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4 (ii) using an acoustic receiver in the other of said two wells for receiving said  
5 signals after passing through said reservoir.

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1 93. (previously presented) The method of claim 92 further comprising using a  
2 controller for processing said signals and determining from said received signals  
3 an indication of pressure transmissivity of said reservoir.

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1 94. (previously presented) The method of claim 92 further comprising:  
2 (A) using a controller for processing said received signals,  
3 (B) using a controller for controlling the operation of a fluid control device in  
4 at least one of the first well and the second well.

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1 95. (new) A downhole injection evaluation system comprising:  
2 a) at least one downhole fiber optic sensor permanently disposed a first well  
3 for sensing at least one parameter associated with injecting a fluid into a  
4 formation; and  
5 (b) at least one downhole acoustic signal generator whereby signals generated  
6 by said at least one signal generator interact with at least one of (I) a fluid  
7 front, and (II) a fracture and are received by said at least one downhole  
8 sensor.

9 wherein said first well is selected from (III) an injection well, and (IV) a  
10 production well.

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